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AUTHOR Feldman, Robert S.; And Others
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ABSTRACT

Subjects were 61 males and females who observed one of four combinations of male and female model performance on an anagram task: (1) male success-female success, (2) male success-female failure, (3) male failure-female success, and (4) male failure-female failure. Subjects' expectations of their own future success and amount of ability relating to anagram performance were assessed as well as subsequent actual performance. Results in the expectation measures showed that, as predicted, male subjects were more influenced by male model performance than were female subjects, but the pattern of greater same-sex model influence did not appear for female subjects. In contrast, only female model performance affected actual success on the anagram task. (Author)

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Modeling Processes in the Development of Sex Role-related Performance Expectations

Robert S. Feldman,
Virginia Commonwealth University

Katherine E. Vorwerk and Penelope Rood
The Catholic University of America

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Modeling Processes in the Development of Sex Role-related Performance Expectations

It has long been apparent that the sex of an individual plays an important role in the learning process. Sex differences in the performance of specific tasks and along certain dimensions are typical findings. For instance, males tend to perform at higher levels than females on tasks relating to visual-spatial ability, while females tend to show greater verbal ability than males (Maccoby & Jacklin, 1974). Yet, the ontogeny of these and other sex differences is far from being established unequivocally, and little research has examined systematically the antecedent conditions that lead to the development of such differential performance in learning situations.

In this paper, we employ a role theoretical framework to explore one factor that may contribute to male-female differences in learning and performance, that of the development of an individual's expectations regarding future performance. Role theory suggests that the expectations an individual holds regarding appropriate or proper behavior in a given situation will have important effects upon that person's actual performance (Sarbin & Allen, 1968). Since sex-role expectations in our society are particularly clear and pronounced--i.e., that males ought to engage in behaviors appropriate for males, while females ought to behave appropriately for females--it would seem likely that sex role factors could affect performance expectations and performance itself on tasks related to the learning process.

Specifically, it may be hypothesized that males would expect to do better on tasks that are perceived as being appropriate for males but not as well on tasks thought to be "female" in nature. Conversely, it could be expected that females ought to have higher expectations for performance on tasks which are understood to be appropriate for females but not for males.

There is, in fact, some previous research that supports the notion of a link between perceived sex-role appropriateness of a task and performance expectancies for that task. Stein, Pohly, and Mueller (1971) found that sixth grade females attached greater value, as well as higher expectancies of success, on tasks labeled as "feminine" than on "masculine" tasks. For males, the converse was true: the boy's expectations for success and assessments regarding the value of the task were significantly higher for so-called "masculine" tasks than "feminine" tasks. Likewise, Stein (1971) found that the more a female defines achievement behavior as feminine, the more apt the female is to display achievement-related motivation. Similarly, male assessments of sex-role appropriateness of achievement in a given area is positively correlated with achievement motivation in that area. Taken together, these studies suggest a causal linkage between sex-role appropriateness of a task and expectations for success.

One important source of the perception of the sex-role appropriateness of a particular task likely is the observation of the sex of models engaged in the task. Both role theory and social

learning theory (Bandura, 1977) suggest that the observation of the behavior of an appropriate model is one determinant of role expectations. The "appropriateness" of a model depends upon a number of factors, including the similarity between the model and observer. For instance, Mischel (1970) found that the greater the perception of similarity on the part of a viewer of a model, the more likely was the viewer to imitate the model. Mischel also suggests that modeling effects are more probable when the observers have relatively little information from their own prior experience about the appropriateness of a given behavior.

Previous research and theory thus suggest that performance expectations regarding a task, and the performance itself, may be influenced by an individual's conception of whether the behavior is role appropriate. In the present study, we were particularly interested in the degree to which a task was viewed as sex role appropriate. A task was employed that was pretested and found to have no previous connotations to either males or females in terms of sex-role appropriateness: performance on anagrams. In order to manipulate subjects' conceptions about the appropriateness of the task for male versus female performance, subjects were shown male and female models who varied in their successfulness in completing the task. Based upon the research on modeling (Sarbin & Allen, 1968; Mischel, 1970), it was expected that subjects' expectations about their own future success, and their actual performance, would be related to the observed performance of the models. More specifically, it was

hypothesized that the sex of the subject would interact with the performance and sex of the models; it was thought that the observation of same-sex model performance would have differential effects from the observation of opposite-sex models.

Method

Task selection

In order to test the hypotheses of the study, it was necessary to find a learning task that did not have either prior male or female connotations to naive subjects, as well as one that did not typically result in differential male or female performance. Behavior in solving anagrams appeared to meet these criteria. Maccoby & Jacklin (1974) report that although there is some evidence for female superiority in solving anagrams, most studies report no difference between male and female performance.

In order to determine if subjects' had differential sex-role expectations regarding anagram performance, a questionnaire was administered to 76 female and 42 male undergraduates. The questionnaire consisted of 14 activities, including the items of sewing, car repair, and anagram solving. Each activity was followed by a five-point Likert-type scale which asked whether the task would be most appropriately done by a male or female. Results on the anagram item showed that it was indeed viewed as a neutral task: the mean rating was 2.97 on the five-point scale, where 1 = a masculine task and 5 = a feminine task. In addition, there was no significant

difference between the male and female raters. It was thus thought that performance on anagrams was an appropriate experimental task.

Subjects

There were 61 eleventh grade public high school students who voluntarily acted as subjects in the experiment. About half the subjects were male and half were female. Subjects were assigned randomly to condition with the restriction that approximately equal numbers of male and female subjects were assigned to each experimental condition. Subjects were run in same-sex groups of one to four in size. All subjects in each group were assigned to the same experimental condition. Approximately half the subjects were run by a male experimenter and the other half by a female experimenter.

Procedure

Subjects were informed that they were going to be participating in a study on strategies of thinking processes using anagrams. They were told that the main purpose of the experiment was for them to solve a series of anagrams. Ostensibly in order to allow the subject "to get an idea of some sample strategies that people use," the subject was told that he or she would view a movie of four people each completing one anagram. Each of the persons in the film supposedly had been given 30 seconds to complete one anagram, each of which was osentsibly of equivalent difficulty to the other anagrams shown in the movie. At the end of the time, or when the person had solved

the anagram (whichever came first), an experimenter was shown on the film removing the anagram. To ensure that the anagrams were indeed equally difficult, all of the ones used in the film were drawn from a list of nouns standardized for concreteness, imagery, meaninfulness, and frequency by Paivio, Yuille, & Madigan (1968). All were five-letter anagrams with only one solution.

After hearing the instructions, subjects were then shown the four individuals sequentially on the film. Since the persons in the film were actually actors, the apparent success and sex of the four persons could be controlled, and this constituted the manipulation of the independent variable. The four combinations of actor success were:

(1) Male success-female success. In this condition, two males were shown solving the anagrams within the 30 seconds, as were two females. Thus, the four models on the tape each successfully completed the task.

(2) Male success-female failure. Here, the two male models were shown to succeed in correctly solving their anagram (as in the first condition), but the two females in the film both were unable to complete their anagram within the allotted time.

(3) Male failure-female success. In this condition, the converse of the male success-female failure condition, only the female models successfully completed their anagrams, while the male models both failed.

(4) Male failure-female failure. This condition showed all four models failing to solve their anagrams within the given 30-second time period.

Each subject was placed in only one of the four conditions. The order of presentation of the models within each condition was counterbalanced to avoid order effects.

Dependent Measures

After viewing the films, the subject was administered the dependent measures, which were designed to assess subjects' expectations regarding their own future success in solving anagrams, as well as measuring subjects' actual performance. Subjects first completed two Likert-type seven-point scales that asked, "How well do you think that you are going to do in solving anagrams yourself?" and "How much ability do you think you have in solving anagrams?"

Subjects were then given a set of 20 scrambled anagrams with lengths of three to six letters and were told to complete as many of the anagrams as possible in a five-minute period. After completion of the anagram tasks subjects were asked to identify the success and sex of the various models in the films they had viewed. These questions served as manipulation checks.

Following completion of the experiment, subjects were thoroughly debriefed and were told that the people they had seen in the film had been actors. No subjects expressed suspicion.

Models

There were two male and two female models used in the films. An attempt was made to standardize behavior between the male and female models within the conditions of success or failure. When a

male or female was shown to succeed, both solved the anagram 20 seconds after being given it by the experimenter, and then waited 10 seconds for the experimenter's return. When a male or female model was shown to fail, neither solved the anagram within the allotted 30 seconds, and they moved the letters of the anagram (which were printed on cards large enough to be seen by the film viewers) around the table at which they were seated, apparently trying to find the solution until the experimenter returned.

Method of Analysis

An initial 2 x 2 x 2 x 2 between subjects analysis of variance was conducted on each of the two measures of expectation ("how well do you think that you are going to do" and "how much ability do you think you have") and on actual anagram performance. The performance measure used was the number of anagrams solved correctly out of the twenty attempted. The four factors in the preliminary analysis were (1) sex of subject, (2) male model performance (success or failure), (3) female model performance (success or failure), and (4) sex of experimenter. Since this analysis revealed that sex of experimenter did not interact significantly with the other independent variables on any of the measures, the major analysis of the data was a 2 x 2 x 2 analysis of variance on the factors of sex of subject, male model performance, and female model performance.

Manipulation Check

Subjects accurately recalled the sex and performance of the models they viewed. There were no differences between male and female subjects; all could correctly identify how well the four models they viewed succeeded and which sex the models were.

Expectation Measures

On the measure asking how well the subject expected to do on the task, there was significant interaction between sex of subject and male model performance, F (1, 53) = 7.39, $p < .01$. No other effects on the analysis were significant. The means involved in this interaction, displayed in Table 1, were analyzed using the Newman-Keuls multiple comparson procedure. As predicted, the performance

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Insert Table 1 about here
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of the male model had a significant effect ($p < .05$) on the expectations of future success for the male subjects; and male model performance had no significant effect for female subjects. Surprisingly, though, male model success resulted in male subjects expecting to do less well when the male model succeeded than when the male model failed (M = 4.33, male model success; M = 5.14, male model failure, on a scale where 1 = low expectations and 7 = high expectations).

Results on the measure of subjects' assessments of their own ability on the anagram task were consistent with the previous expection measure. The only significant effect was again on the interaction of the sex of subject and male model performance, F (1, 53) = 8.31,

Table 1

Means for Performance Expectations

Male Model Behavior	Subject Sex: Male	Female
How well do you think you will do?		
Success	4.33	4.67
Failure	5.14	4.00
How much ability do you have?		
Success	4.13	4.40
Failure	5.00	3.76

Note: Higher numbers indicate greater expectations of success and ability on a 7-point scale.

$p < .006$. As before, the Newman-Keuls tests carried out on the means involved in the interaction (shown in Table 1) reveal that only males were affected by the success of the male model ($p < .05$). Males thought that they had greater ability after viewing the unsuccessful male model ($M = 5.00$) than the successful model ($M = 4.13$). Also as before, the results of the Newman-Keuls test showed that female subjects were not significantly affected by the performance of the male model.

Performance Measure

The number of anagrams successfully solved was entered into a 2 (sex of subject) x 2 (male model success) x 2 (female model success) analysis of variance. The only significant effect was for the success of the female model, F (1, 53) = 6.99, $p < .01$. Subjects performed significantly better when they had seen the female models fail ($M = 11.17$, out of a possible 20 correct) than when the female models had been shown to succeed ($M = 9.39$). Like the previous findings, this result was in an unexpected direction.

In order to better understand the relationship between the measures of expectation for success and actual performance, correlations were calculated between the measures. There were modest positive correlations between the measure of how well subjects thought they would do and actual performance, $r = .39$, $p < .01$, and between subjects' perception of ability and actual performance, $r = .28$, $p < .05$. As would be expected from the pattern of results, there was also a

strong positive correlation between the two measures of expectations: $r = .80$, $p < .001$.

Discussion

It appears that the hypotheses of the present study were at least partially supported. Male subjects were influenced in their expectations of future success by the performance of the male models, while females were not. However, the findings did not indicate that the female subjects' expectations were more influenced by the performance of the female models than the male models, as had been expected. We may speculate that the high school-age female subjects perhaps have been socialized to expect to do poorly on new tasks, a trend that has been noted by Maccoby and Jacklin (1974). Thus, the models' behavior--regardless of whether male or female--may have had little impact upon expectations that had developed previous to participation in the experiment. Some slight evidence for such speculation comes from a trend shown on the measure of ability: female subjects tended to rate themselves marginally lower in ability ($M = 4.06$) than did the male subjects ($M = 4.55$), $F(1, 53) = 3.52$, $p < .06$.

The direction of the effect of the male model on the male subjects expectations is noteworthy. Male subjects had higher expectations for future performance and thought they had greater ability when the male models performed poorly than when they performed well. The direction of this effect casts doubt upon a straight-forward

modeling explanation of the male subjects' results. Perhaps we are dealing with a phenomenon relating to male competitiveness. Males in general tend to show greater arousal of achievement motivation under conditions of competition, and the failure of the male models may have led to greater feelings of competitiveness and particularly the prospect of successful competitiveness.

Results on the measure of performance, the actual number of anagrams solved, stand in contrast to the results found on the two measures of expectation. On this measure, it was only the success of the female model that had an effect. Both males and females performed better after seeing female models fail than after viewing female models being successful. The direction of these results again argues against a simple modeling explanation for the findings. One possible explanation is that the viewing of female model success tended to label the task as being "feminine" in nature. Since it can be argued that success in male-appropriate pursuits is more highly valued than success in female-appropriate fields, then it is possible that the subjects tried less hard to succeed when the task was seen as being "feminine" (i.e., when they viewed female model success) than when the task was not feminine-appropriate (under conditions of female model failure). This would lead to superior performance under conditions of female model failure rather than female model success.

Still, it is difficult to reconcile the results on the measures of expectation (in which male model performance was crucial) to the

results on the actual performance measure (where the female model behavior was the determinant of subject success). It is apparent that expectations of success on a task are not directly related to actual performance on the task; no doubt different psychological processes are operating in determining responses on the two types of measures.

The present findings suggest that performance of models has a differential effect upon observers, depending upon the sex of the models, the success of the models, and the sex of the observer. These results have clear implications for learning situations outside the laboratory. Sex is perhaps the most obvious of all descriptive factors regarding another person to an observer, and hence it is likely that students are cognizant of the sex (and the performance) of other learners in academic settings. Further research that examines the influence that others' performance has upon an individual's own expectations for future success may be important in determining some of the causes of actual scholastic behavior.

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